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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BORIN, MICHAEL L

ART UNIT PAPER NUMBER

1631

DATE MAILED: 01/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/993,272

Applicant(s)

GOUGH ET AL.

Examiner

Michael Borin

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– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/18/2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-18 is/are pending in the application.
- 4a) Of the above claim(s) 8 and 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9, 11-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1,8 are amended. Claim 7 is canceled. Claims 9-18 are added.

Claims 1-6,8-18 are pending.

Amended claim 8 and newly submitted claim 10 are directed to an invention that is independent or distinct from the invention of claims 1-6,9,11-18 for the following reasons:

Inventions of claim 10 and of claims 1-6,9,11-18 are related as patentably distinct methods. The methods have different modes of operation as the method of claims of claims 1-6,9,11-18 is based on entry of primary structure information only, whereas the method of claim 10 is based on entry of "series of features"; further, the method of claim 10 includes use of "labels" not required for method of claims entry of primary structure information .

In regard to amended claim 8, it is now drawn to a system that is independent from method of entry of primary structure information as it requires features not required for entry of primary structure information, namely entering a set of biomolecules "represented as a linear set of features".

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 8,10 are

withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claims 1-6, 9,11-18 are under consideration.

Rejections not reiterated from previous Office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Specification

The specification is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. See, for example, pages 6,9-11,15,17. Applicant is requested to delete the embedded hyperlinks and/or other form of browser-executable code. See MPEP § 608.01(b).

Claim Objections

Claims 11-15,17 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 2-9, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Applicant is advised that should claims 2-9 be found allowable, claims 11-15,17 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112, first paragraph (new matter).

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-6, 9,11-18 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Claim 1 introduces new matter as it recites analyzing "fragments" of the first and second molecules. Neither the original claims, nor specification addresses "fragments".

Note, that in communication mailed 09/15/2004 applicant was requested to demonstrate support in specification for the amended claim language. In response, in regard to amendment to claim 1, applicant points at paragraphs [0020], [0024]. However, neither these, nor other parts of specification support the claim language addressing "analyzing at least a fragment".

Claim 16 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Claim 16 introduces new matter as it recites specific features of support vector machine (for example, "statistical decision surface", "high-dimensional feature space") which have not been addressed in specification. Nor there is any incorporation by reference of a description of support vector machines. It is noted that applicant submits that "claim 16 is supported by the computer program" (p. 11 of the response); however, which program, and which component of the program are not specified.

Claim Rejections - 35 USC § 112, second paragraph.

The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6, 9,11-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The rejection is applied for the following reasons.

A. Claim 1: It is not clear how a "set of biomolecules" can comprise a "primary structure"?

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B. Claim 1: It is not clear how the interaction domains in the first set are being selected and how the value for binding is assigned. It seems that the claim language describes general direction of action without specifying particular method steps.

C. Claim 1: It is not clear what method step is meant by "analyzing and assigning at least one fragment..." - what, specifically, is involved in "analyzing and assigning".

D. Claim 1: Claim 1, last paragraph. According to the claim language "predicting" results from "analyzing" of "binding". However, first, value of "binding" is obtained in two recited steps of "assigning a value of binding". It is not clear what is the difference between these steps and which binding value is being used thereafter. Second, for the first "assigning" step, it is not clear value for binding of what to the second molecule is addressed. Third, for the first "assigning" step, it is not clear how one value of binding can be assigned for binding to a plurality of different fragments ("at least one fragment"). Fourth, it is not clear which "first fragment" and "second fragment" are addressed, as there is no antecedent basis for "first fragment" and "second fragment" in last paragraph of claim 1. Preceding claim language does not specify what "first fragment" or "second fragment" are; contrary, it addresses plurality of fragments ("a fragment or more") for both first and second biomolecule.

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E. Claims 4-6,13-15: It is not clear which biomolecule is meant. Base claim 1 addresses different biomolecules and sets of biomolecules.

F. Claims 3-6 , 12-15 lack proper antecedent basis: it is not clear which "biomolecule" is being addressed.

Claim Rejections - 35 USC § 102 and 103.

Claims 1-6, 9,11-18 are rejected under 35 U.S.C. 103(a) as obvious over Braunheim (US Patent 6,587,845) in view of Jeng et al.

Note that Braunheim (US Patent 6,587,845) reference was used previously in rejection made under 35 U.S.C. 102(e). As the claims amended to recite use of support learning machines, the rejection is changed now to rejection under 35 U.S.C. 103(a).

The instant claims are drawn to predicting interactions between molecules with unknown interactions based on analogy to biomolecules in the trainable set comprising biomolecules with known interactions. The trainable system used in the method is a support learning machine (SVM).

Braunheim teaches a neural network which is "trained" with the bioactivity of known compounds and then is used to predict the bioactivity of unknown compounds. The predictive value of the system is gained through the use of "training" process after which the system is able to predict chemical characteristics, such as binding, for unknown molecules. The unknown molecules can be bioactive agents such as proteins, nucleic acids, etc. See abstract, col. 2, second paragraph, claims 1,21,24.

Braunheim et al do not teach use of support learning machine (SVM). However, first, Jeng et al teach that SVM improve performance of neural networks (see abstract); consequently, one skilled in the art would be motivated to use SVM to facilitate problem solving by neural networks described in Braunheim. Second, as acknowledged in the specification, "the trainable system algorithm is not a limiting aspect of the invention", and thus, using SVMs, even though possibly somewhat improving operation of the method, does not patentably distinguish it from other methods utilizing neural network approach.

Applicant argues that instant invention uses primary information, rather than tertiary structural information addressed in Braunheim. However, the claims use open language "comprising", and any tertiary structural information is derived from the information of the primary structure and thus comprises such information. On the other hand, the instantly claimed method, clearly, is not limited to the use of primary information because it assesses interaction between "interaction domains" which are frequently not a sequence of consecutive residues but rather a three dimensional assembly of non-consecutive residues.

Further, applicant argues that in the instant invention "determination of an interaction is binary, either meeting threshold or not". Examiner disagrees. Nowhere in the claims the decision making is reduced to a binary result: binding is indicated by a value (which is not binary and can be reflected by binding energy, for example), and binding of fragments is assigned values which are not binary either.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See

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MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Borin whose telephone number is (571) 272-0713. The examiner can normally be reached on 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ardin Marschel, Ph.D., can be reached on (571) 272-0718. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 Michael Borin, Ph.D.
Primary Examiner
Art Unit 1631

mlb